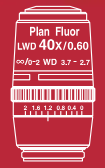
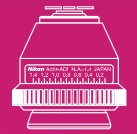
MICROSCOPE COMPONENTS FOR TRANSMITTED LIGHT APPLICATIONS

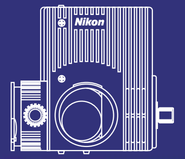
Objectives



Condensers



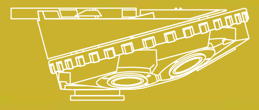
Illumination Systems



Eyepiece Tubes

Eyepieces

Nosepieces



CCTV Camera Adapters

En

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- CFI Plan Apochromat 60x Oil / CFI Plan Apochromat DM 60x Oil
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- Collector Lens/QH100W
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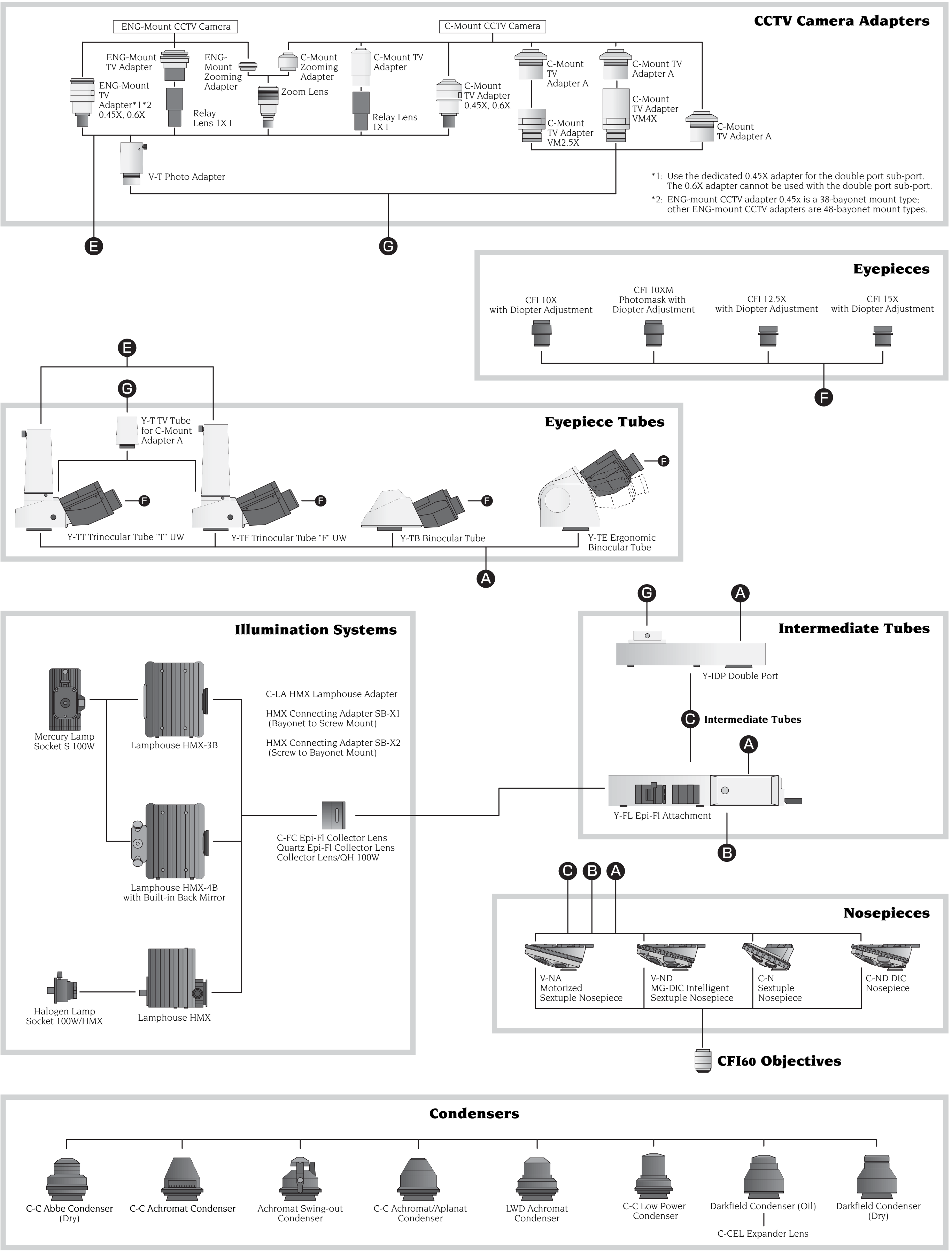
- Zoom Lens
- C-Mount Zooming Adapter
- ENG-Mount Zooming Adapter
- C-Mount TV Adapter 0.45x
- C-Mount TV Adapter 0.6x
- ENG-Mount TV Adapter 0.45x (for Trinocular Tube “F”, “T”)
- ENG-Mount TV Adapter 0.6x (for Trinocular Tube “F”, “T”)
- C-Mount TV Adapter VM 2.5x
- C-Mount TV Adapter VM 4x

System Diagram


CCTV Camera Adapters
ENG-Mount CCTV Camera
C-Mount CCTV Camera
ENG-Mount TV Adapter
ENG-Mount TV Adapter*1*2 0.45X, 0.6X
Relay Lens 1X I
ENG-Mount Zooming Adapter
C-Mount Zooming Adapter
Zoom Lens
C-Mount TV Adapter
Relay Lens 1X I
C-Mount TV Adapter 0.45X, 0.6X
C-Mount TV Adapter A
C-Mount TV Adapter VM2.5X
C-Mount TV Adapter A
C-Mount TV Adapter VM4X
C-Mount TV Adapter A
V-T Photo Adapter
*1: Use the dedicated 0.45X adapter for the double port sub-port. The 0.6X adapter cannot be used with the double port sub-port.
*2: ENG-mount CCTV adapter 0.45x is a 38-bayonet mount type; other ENG-mount CCTV adapters are 48-bayonet mount types.
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Y-TT Trinocular Tube "T" UW
Y-TF Trinocular Tube "F" UW
Y-TB Binocular Tube
Y-TE Ergonomic Binocular Tube
A
G
A
Illumination Systems
Mercury Lamp Socket S 100W
Lamphouse HMX-3B
C-LA HMX Lamphouse Adapter
HMX Connecting Adapter SB-X1 (Bayonet to Screw Mount)
HMX Connecting Adapter SB-X2 (Screw to Bayonet Mount)
Lamphouse HMX-4B with Built-in Back Mirror
C-FC Epi-Fl Collector Lens
Quartz Epi-Fl Collector Lens
Collector Lens/QH 100W
Halogen Lamp Socket 100W/HMX
Lamphouse HMX
Intermediate Tubes
Y-IDP Double Port
C Intermediate Tubes
A
Y-FL Epi-Fl Attachment
B
C B A
Nosepieces
V-NA Motorized Sextuple Nosepiece
V-ND MG-DIC Intelligent Sextuple Nosepiece
C-N Sextuple Nosepiece
C-ND DIC Nosepiece
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Condensers
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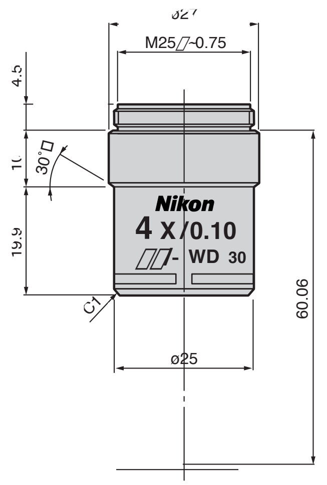
C-C Achromat Condenser
Achromat Swing-out Condenser
C-C Achromat/Aplanat Condenser
LWD Achromat Condenser
C-C Low Power Condenser
Darkfield Condenser (Oil)
Darkfield Condenser (Dry)
C-CEL Expander Lens

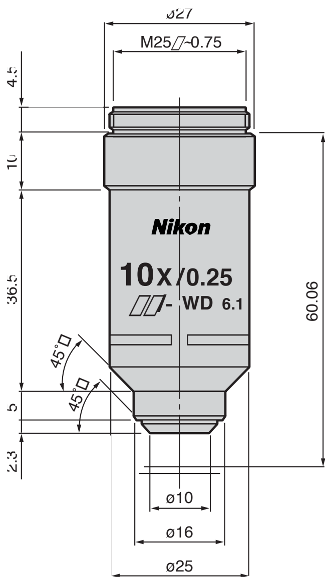
CFI60 OBJECTIVES

CFI Achromat Series for Brightfield/Phase Contrast (DL)

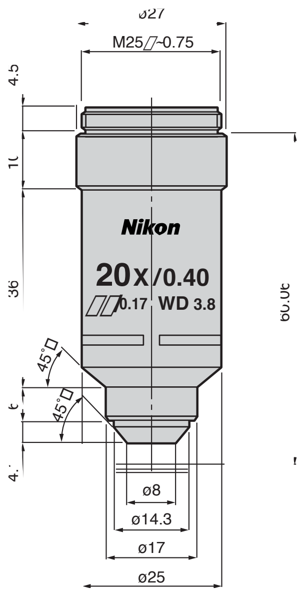
Correction for chromatic aberration in these objectives have been dramatically improved and are at the same level as the CFI Plan Achromat Series. These objectives were also corrected for spherical aberration and coma and image flatness across the 22mm field of view has been drastically improved.
The result: truly exceptional quality for this class of objectives.
The DL phase contrast objectives in this series have more contrast than the DLL objectives for enhanced contrast with unstained specimens.



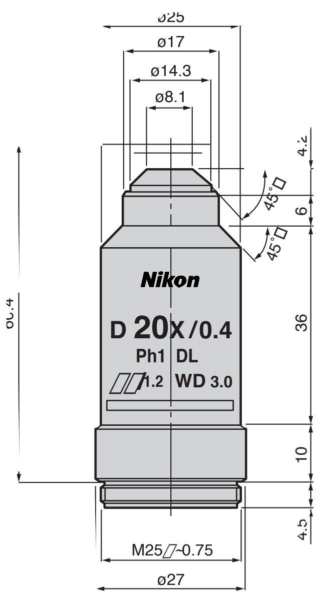
CFI Achromat 4x



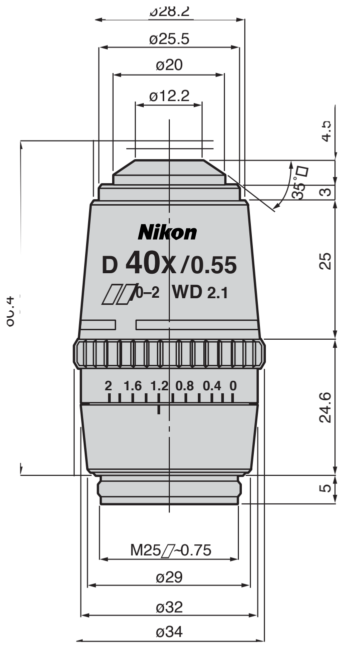
CFI Achromat 10x
CFI Achromat DL 10x



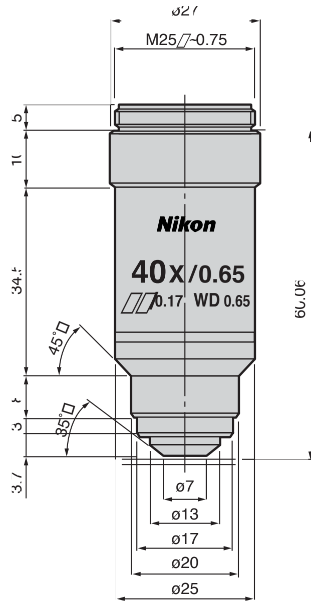
CFI Achromat LWD 20x
CFI Achromat LWD DL 20x



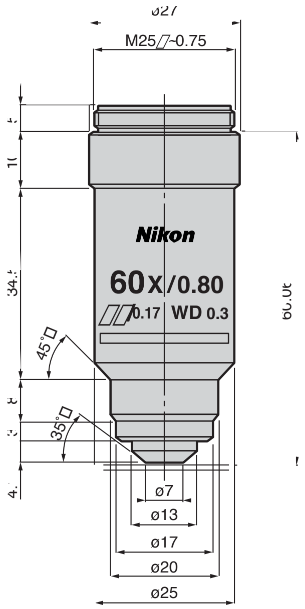
CFI Achromat LWD DL 20x F



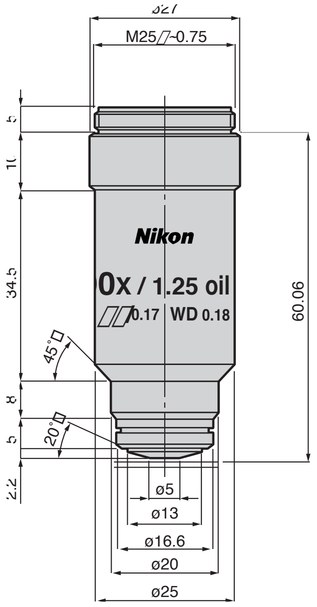
CFI Achromat LWD 40x C
CFI Achromat LWD DL 40x C



CFI Achromat 40x
CFI Achromat DL 40x



CFI Achromat 60x



CFI Achromat 100x Oil
CFI Achromat DL 100x Oil

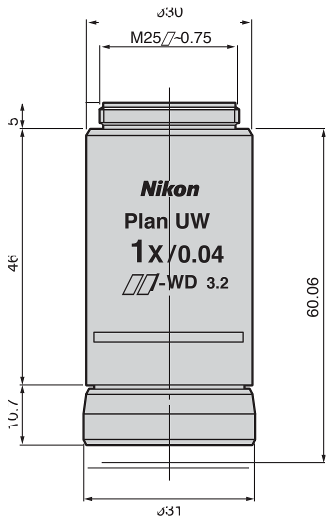
Objectives (magnification)	N.A.	W.D. (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Remarks	Phase ring
CFI Achromat 4x	0.10	30.0	50.0	27.50	72		
CFI Achromat 10x	0.25	6.1	20.0	4.40	85		
CFI Achromat DL 10x	0.25	6.1	20.0	4.40	85		ph1
CFI Achromat LWD 20x	0.40	3.8	10.0	1.72	90		
CFI Achromat LWD DL 20x	0.40	3.8	10.0	1.72	90		ph1
CFI Achromat 40x	0.65	0.65	5.0	0.65	130	Spring-loaded	
CFI Achromat DL 40x	0.65	0.65	5.0	0.65	130	Spring-loaded	ph2
CFI Achromat 60x	0.80	0.3	3.3	0.43	130	Spring-loaded	
CFI Achromat 100x Oil	1.25	0.18	2.0	0.27	130	Spring-loaded	
CFI Achromat DL 100x Oil	1.25	0.18	2.0	0.27	130	Spring-loaded	ph3
CFI Achromat LWD DL 20x F	0.40	3.0	10.0	1.72	90	Cover glass thickness 1.2mm	ph1
CFI Achromat LWD 40x C	0.55	2.7–1.7	5.0	0.91	195	Cover glass correction 0.2mm	
CFI Achromat LWD DL 40x C	0.55	2.7–1.7	5.0	0.91	195	Cover glass correction 0.2mm	ph2

CFI60 OBJECTIVES

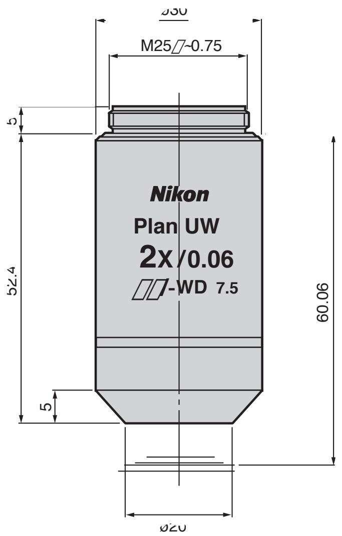
CFI Plan Achromat Series for Brightfield/Phase Contrast (DL)

These objectives provide incredible image flatness over the entire 25mm field of view, with chromatic aberration corrected throughout the entire visible spectrum. These objectives are suitable not only for routine laboratory work but for photomicrography.

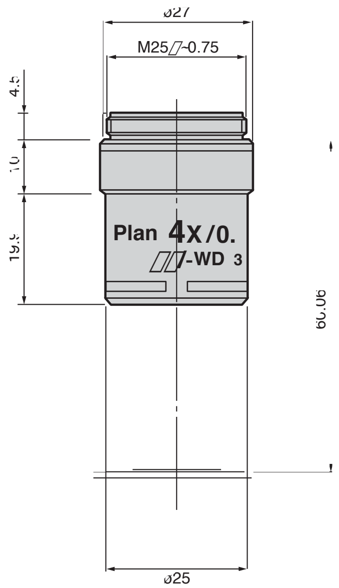
The DL phase contrast objectives in this series have more contrast than the DLL objectives for enhanced contrast with unstained specimens.



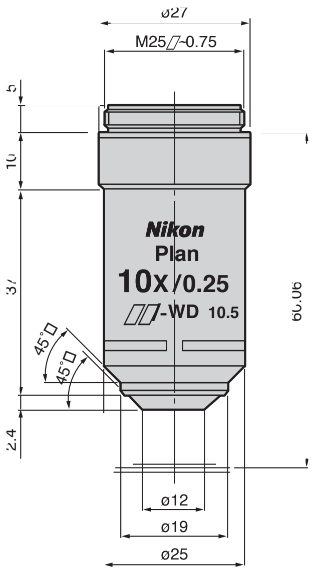
CFI Plan Achromat UW 1x



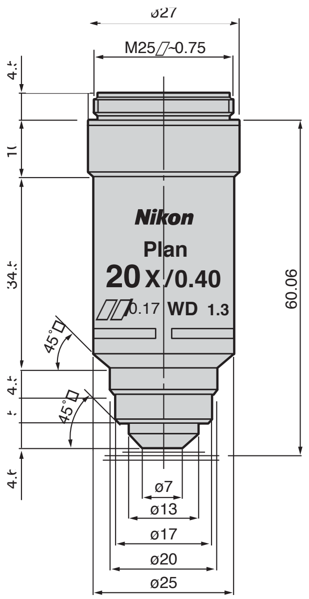
CFI Plan Achromat UW 2x



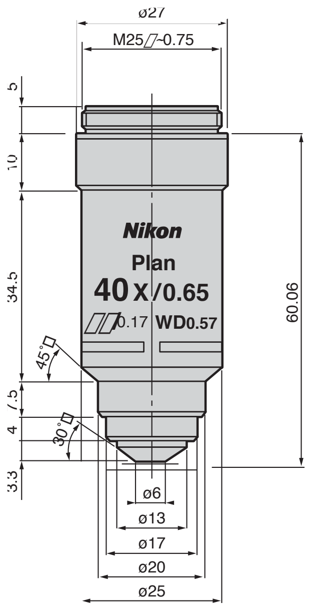
CFI Plan Achromat 4x



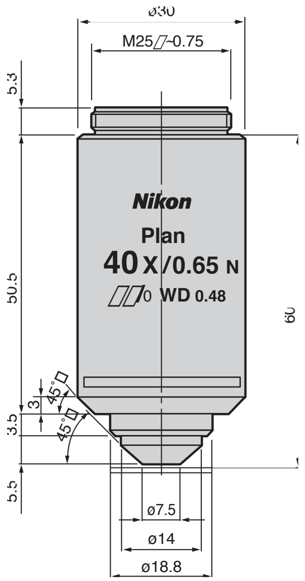
CFI Plan Achromat 10x
CFI Plan Achromat DL 10x



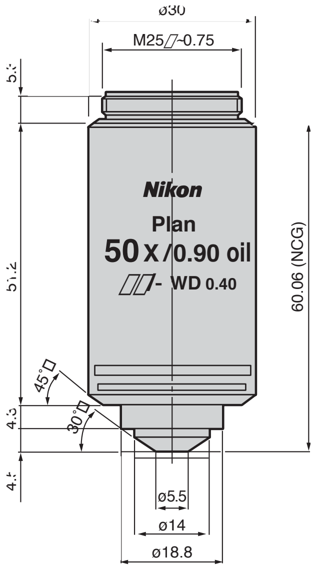
CFI Plan Achromat 20x
CFI Plan Achromat DL 20x



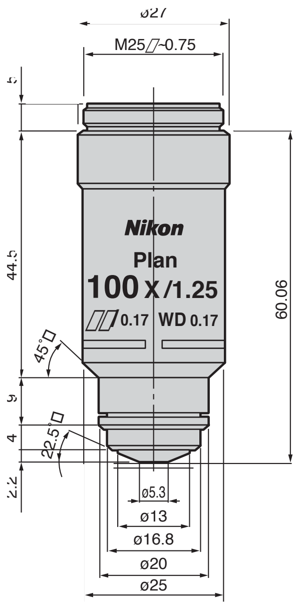
CFI Plan Achromat 40x
CFI Plan Achromat DL 40x



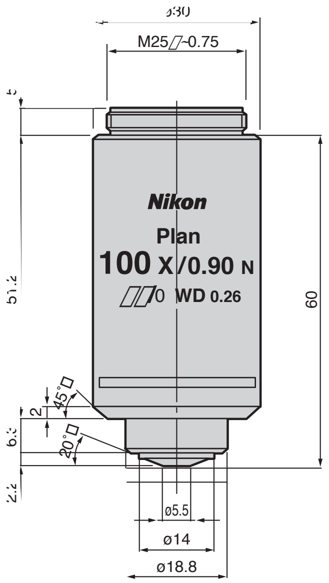
CFI Plan Achromat 40x NCG



CFI Plan Achromat 50x Oil



CFI Plan Achromat 100x Oil
CFI Plan Achromat DL 100x Oil



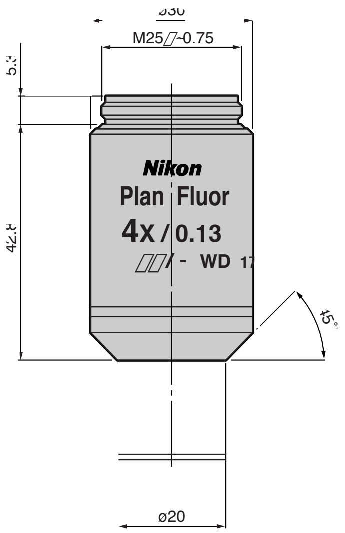
CFI Plan Achromat 100x NCG

Objectives (magnification)	N.A.	W.D. (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Remarks	Phase ring
CFI Plan Achromat UW 1x	0.04	3.2	200.0	171.88	180		
CFI Plan Achromat UW 2x	0.06	7.5	100.0	76.39	110		
CFI Plan Achromat 4x	0.10	30.0	50.0	27.50	65		
CFI Plan Achromat 10x	0.25	10.5	20.0	4.40	85		
CFI Plan Achromat DL 10x	0.25	10.5	20.0	4.40	85		ph1
CFI Plan Achromat 20x	0.40	1.3	20.0	1.72	85		
CFI Plan Achromat DL 20x	0.40	1.3	20.0	1.72	85		ph1
CFI Plan Achromat 40x	0.65	0.57	5.0	0.65	115	Spring-loaded	
CFI Plan Achromat DL 40x	0.65	0.57	5.0	0.65	115	Spring-loaded	ph2
CFI Plan Achromat 40x NCG	0.65	0.48	5.0	0.65	160	Spring-loaded No cover grass	
CFI Plan Achromat 50x Oil	0.90	0.4	4.0	0.52	160	Spring-loaded	
CFI Plan Achromat 100x Oil	1.25	0.17	3.3	0.52	160	Spring-loaded	
CFI Plan Achromat DL 100x Oil	1.25	0.17	3.3	0.52	160	Spring-loaded	ph3
CFI Plan Achromat 100x NCG	0.90	0.26	2.0	0.18	160	Spring-loaded No cover grass	

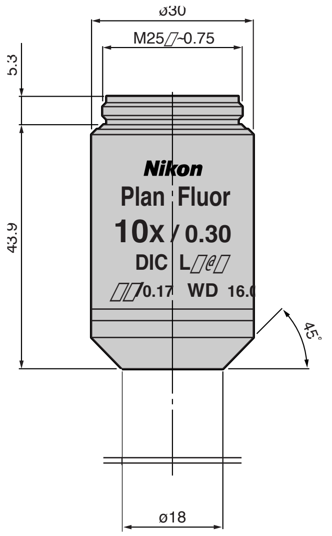
CFI60 OBJECTIVES

CFI Plan Fluor Series for Brightfield/Phase Contrast (DLL)

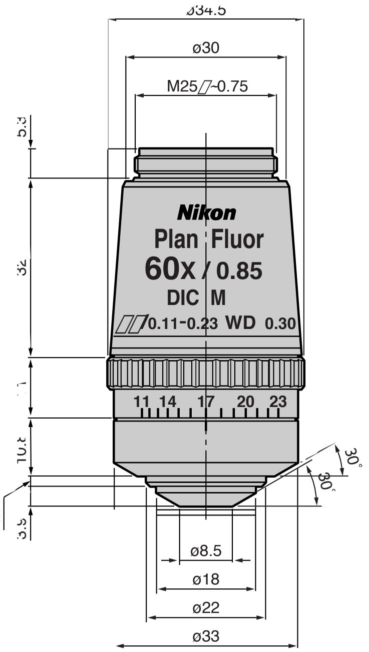
Featuring an extra-high transmission rate, especially in the ultraviolet wavelength, and flatness of field comparable to the CFI Plan Achromat series, these objectives are designed for fluorescence observation and photomicrography. Because of this improvement in quality, these objectives can function as multi-purpose objectives for brightfield, fluorescence, polarizing, and DIC observations.
The DLL (low contrast) phase objectives for this series can also be used as universal objectives for phase contrast, fluorescence, DIC, and brightfield techniques.



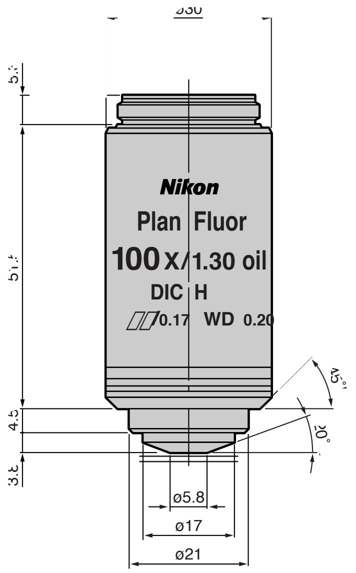
CFI Plan Fluor 4x



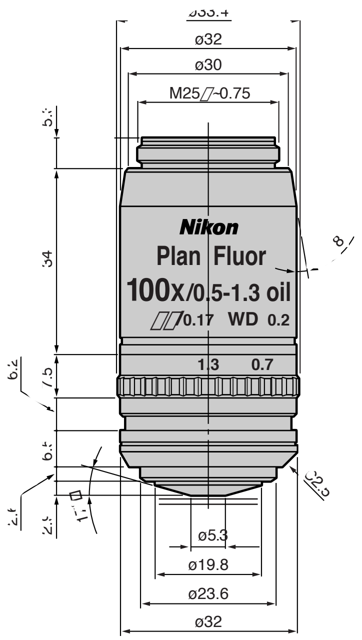
CFI Plan Fluor 10x
CFI Plan Fluor DLL 10x



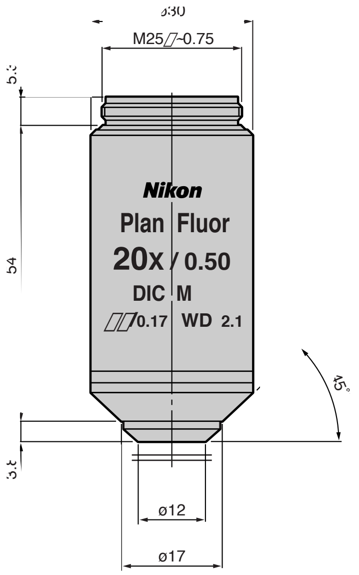
CFI Plan Fluor 60x C



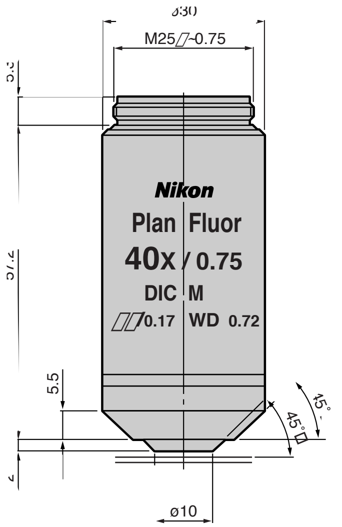
CFI Plan Fluor 100x Oil
CFI Plan Fluor DLL 100x Oil



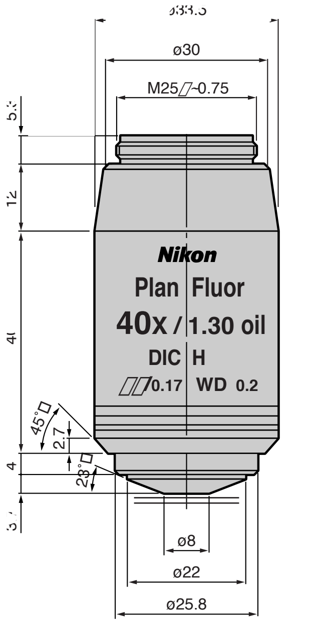
CFI Plan Fluor 100x Oil with iris diaphragm



CFI Plan Fluor 20x
CFI Plan Fluor DLL 20x



CFI Plan Fluor 40x
CFI Plan Fluor DLL 40x

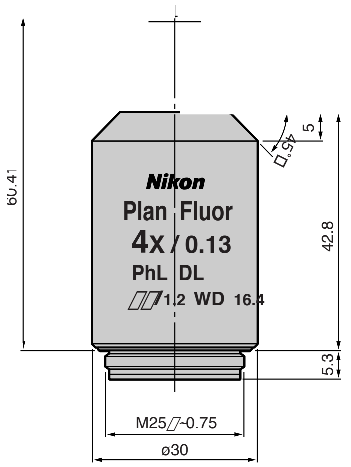


CFI Plan Fluor 40x Oil

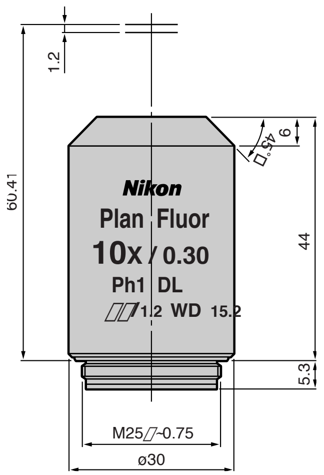
Objectives (magnification)	N.A.	W.D. (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Remarks	Phase ring
CFI Plan Fluor 4x	0.13	17.1	50.0	16.27	110		
CFI Plan Fluor 10x	0.30	16.0	20.0	3.06	120		
CFI Plan Fluor DLL 10x	0.30	16.0	20.0	3.06	120		ph1
CFI Plan Fluor 20x	0.50	2.1	10.0	1.10	175		
CFI Plan Fluor DLL 20x	0.50	2.1	10.0	1.10	175		ph1
CFI Plan Fluor 40x	0.75	0.72	5.0	0.49	210	Spring-loaded	
CFI Plan Fluor DLL 40x	0.75	0.72	5.0	0.49	210	Spring-loaded	ph2
CFI Plan Fluor 40x Oil	1.30	0.2	5.0	0.25	230	Spring-loaded Stopper	
CFI Plan Fluor 60x C	0.85	0.3	3.3	0.38	265	Spring-loaded Cover glass correction 0.11–0.23mm	
CFI Plan Fluor 100x Oil	1.30	0.2	2.0	0.25	250	Spring-loaded Stopper	
CFI Plan Fluor DLL 100x Oil	1.30	0.2	2.0	0.25	250	Spring-loaded Stopper	ph3
CFI Plan Fluor 100x Oil with iris diaphragm	0.5–1.3	0.2	2.0	0.25	285	Spring-loaded With iris diaphragm	

CFI Plan Fluor Series for Phase Contrast (DL)

These objectives have more contrast than the DLL objectives for enhanced contrast with tissue culture specimens. These objectives are designed for use on inverted microscopes and therefore their markings are upside-down for easy reading.



CFI Plan Fluor DL 4x



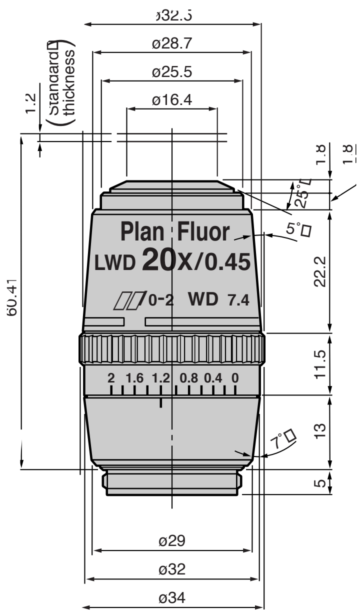
CFI Plan Fluor DL 10x

Objectives (magnification)	N.A.	W.D. (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Remarks	Phase ring
CFI Plan Fluor DL 4x	0.13	16.4	50.0	16.27	105	Cover glass thickness 1.2mm	phL
CFI Plan Fluor DL 10x	0.30	15.2	20.0	3.06	120	Cover glass thickness 1.2mm	ph1

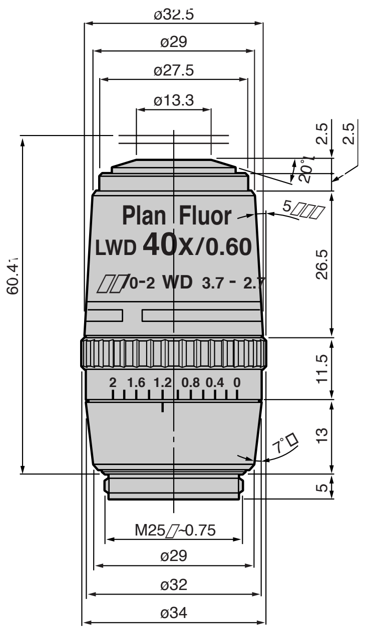
CFI60 OBJECTIVES

CFI Plan Fluor ELWD Series for Brightfield/Phase Contrast (DM/DLL)

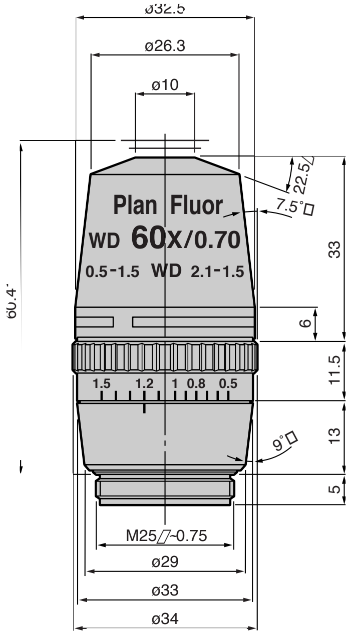
Offering superb flatness of field, high UV transmission rates, and high Numerical Apertures with extra long working distances, these objectives are well suited for fluorescence observations, especially with inverted microscopes. Because of their superior optical design, CFI Plan Fluor ELWD DM objectives can be used universally for all other observation techniques, including brightfield, fluorescence, phase contrast, and Nomarski DIC.
The DM phase contrast objectives have higher contrast to enhance the image of very thin, highly detailed specimens with low phase gradients.
The DLL objectives have less contrast for thicker, more contrasty specimens.



CFI Plan Fluor ELWD 20x C
CFI Plan Fluor ELWD DM 20x C



CFI Plan Fluor ELWD 40x C
CFI Plan Fluor ELWD DM 40x C

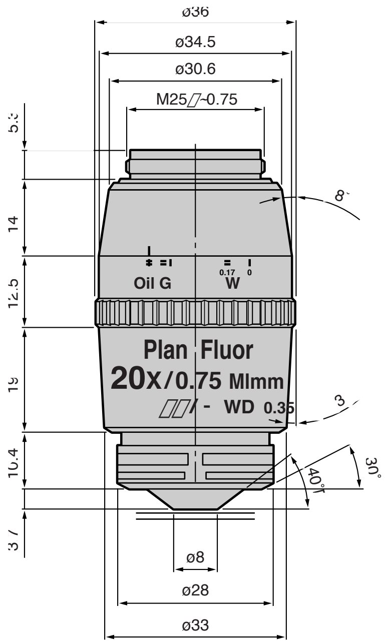


CFI Plan Fluor ELWD 60x C
CFI Plan Fluor ELWD DLL 60x C

Objectives (magnification)	N.A.	W.D. (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Remarks	Phase ring
CFI Plan Fluor ELWD 20x C	0.45	8.1–7.0	10.0	1.36	195	Cover glass correction 0–2mm	
CFI Plan Fluor ELWD DM 20x C	0.45	8.1–7.0	10.0	1.36	195	Cover glass correction 0–2mm	ph1
CFI Plan Fluor ELWD 40x C	0.60	3.7–2.7	5.0	0.76	195	Cover glass correction 0–2mm	
CFI Plan Fluor ELWD DM 40x C	0.60	3.7–2.7	5.0	0.76	195	Cover glass correction 0–2mm	ph2
CFI Plan Fluor ELWD 60x C	0.70	2.1–1.5	3.3	0.56	210	Cover glass correction 0.5–1.5mm	
CFI Plan Fluor ELWD DLL 60x C	0.70	2.1–1.5	3.3	0.56	210	Cover glass correction 0.5–1.5mm	ph2

Multi-Immersion Objective for Brightfield

This multi-purpose immersion objective has a higher numerical aperture and superior contrast. The use of immersion media helps eliminate surface reflections and provides an image with higher contrast. It is an excellent objective for fluorescence, brightfield, and DIC observation techniques.
This unique objective has a correction collar that allows it to be used with immersion oil, glycerin, and water (with and without a cover glass).

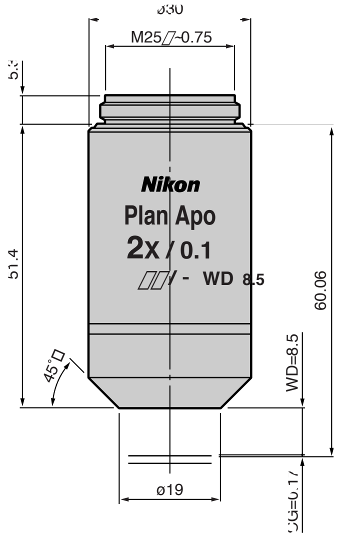


CFI Plan Fluor 20x MI

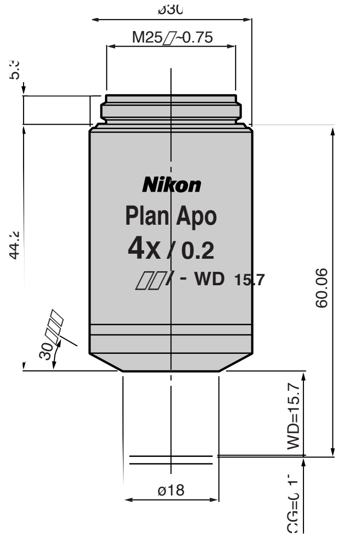
Objective (magnification)	N.A.	W.D. (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Remarks
CFI Plan Fluor 20x MI	0.75	0.35–0.33	10.0	0.49	300	Multi-immersion Oil-glycerine-water

CFI Plan Apochromat Series for Brightfield/Phase Contrast (DM)

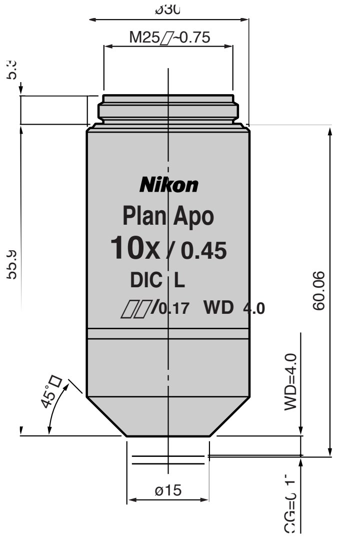
These objectives feature longer working distances with high Numerical Apertures and is designed to correct all optical aberrations throughout the visible spectrum from violet to red from center to edges across the entire 25mm field of view. Superior image flatness and color reproduction, plus resolving power at the theoretical limit of today's optical technology are also featured.
The DM phase contrast Plan Apochromats have higher contrast to enhance images of very thin, highly detailed specimens with low phase gradients.



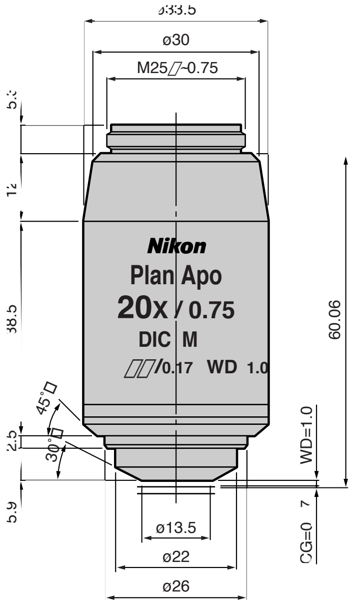
CFI Plan Apochromat 2x



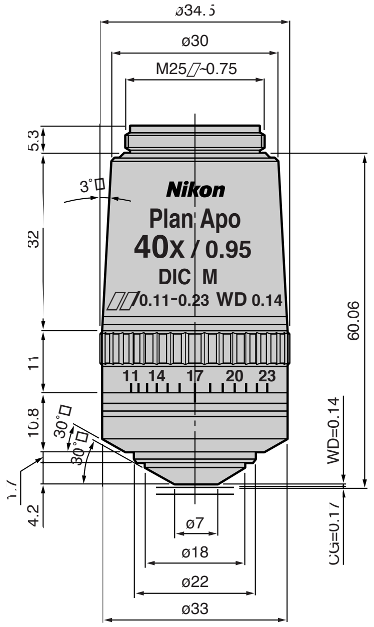
CFI Plan Apochromat 4x



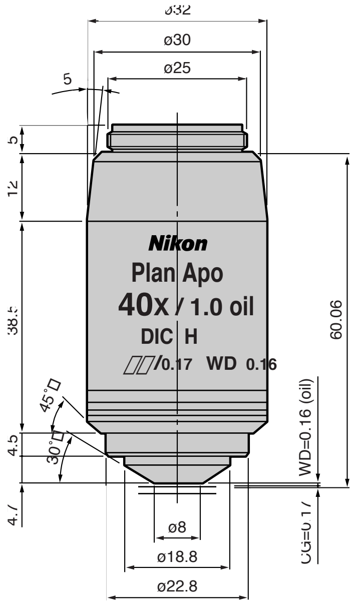
CFI Plan Apochromat 10x



CFI Plan Apochromat 20x
CFI Plan Apochromat DM 20x

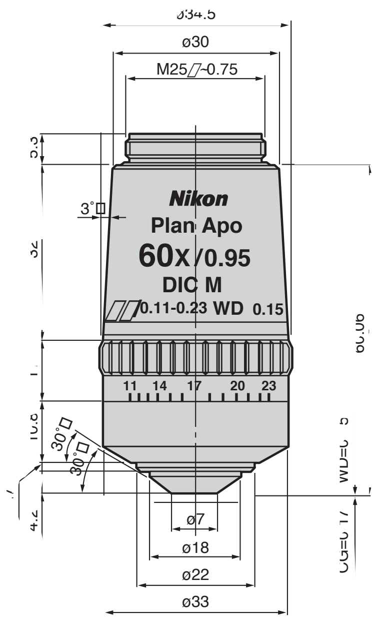


CFI Plan Apochromat 40x C
CFI Plan Apochromat DM 40x C

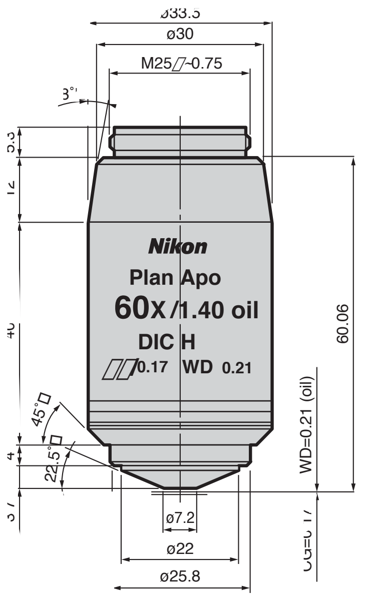


CFI Plan Apochromat 40x Oil
CFI Plan Apochromat DM 40x Oil

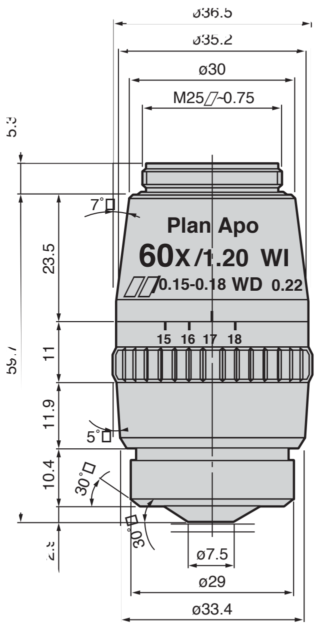
CFI Plan Apochromat Series for Brightfield/Phase Contrast (DM)



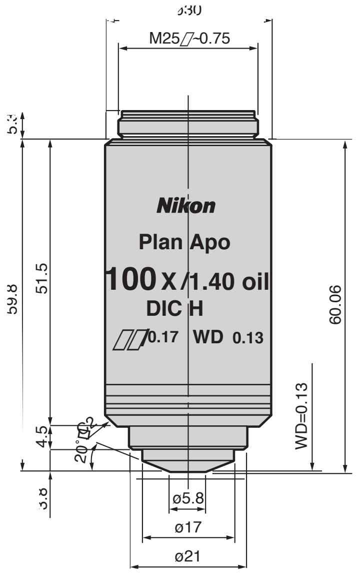
CFI Plan Apochromat 60x C
CFI Plan Apochromat DM 60x C



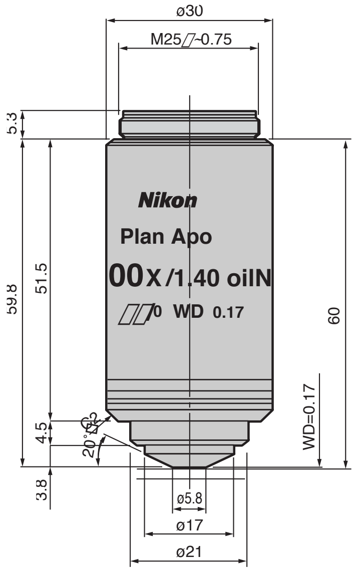
CFI Plan Apochromat 60x Oil
CFI Plan Apochromat DM 60x Oil



CFI Plan Apochromat 60x WI



CFI Plan Apochromat 100x Oil
CFI Plan Apochromat DM 100x Oil

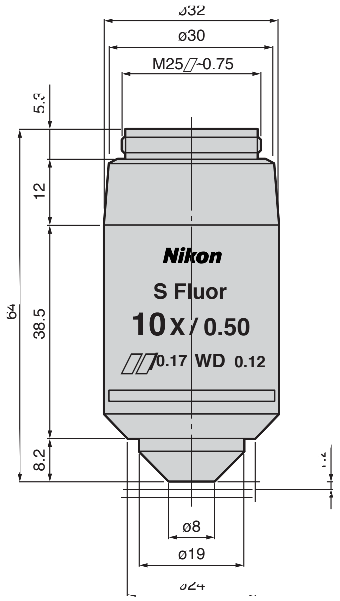


CFI Plan Apochromat 100x NCG Oil

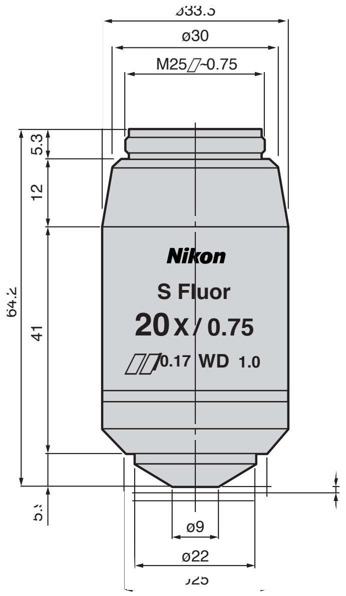
Objectives (magnification)	N.A.	W.D. (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Remarks	Phase ring
CFI Plan Apochromat 2x	0.10	8.5	100.0	27.50	180		
CFI Plan Apochromat 4x	0.20	15.7	50.0	6.88	180		
CFI Plan Apochromat 10x	0.45	4.0	20.0	1.36	220		
CFI Plan Apochromat 20x CFI Plan Apochromat DM 20x	0.75 0.75	1.0 1.0	10.0 10.0	0.49 0.49	240 240	Spring-loaded Spring-loaded	 ph2
CFI Plan Apochromat 40x C CFI Plan Apochromat DM 40x C	0.95 0.95	0.14 0.14	5.0 5.0	0.30 0.30	270 270	Spring-loaded Cover glass correction 0.11–0.23mm Spring-loaded Cover glass correction 0.11–0.23mm	 ph2
CFI Plan Apochromat 40x Oil CFI Plan Apochromat DM 40x Oil	1.0 1.0	0.16 0.16	5.0 5.0	0.42 0.42	240 240	Spring-loaded Stopper Spring-loaded Stopper	 ph3
CFI Plan Apochromat 60x C CFI Plan Apochromat DM 60x C	0.95 0.95	0.15 0.15	3.3 3.3	0.30 0.30	285 285	Spring-loaded Cover glass correction 0.11–0.23mm Spring-loaded Cover glass correction 0.11–0.23mm	 ph2
CFI Plan Apochromat 60x Oil CFI Plan Apochromat DM 60x Oil	1.40 1.40	0.21 0.21	3.3 3.3	0.21 0.21	285 285	Spring-loaded Stopper Spring-loaded Stopper	 ph3
CFI Plan Apochromat 60x WI	1.20	0.22	3.3	0.25	285	Spring-loaded Cover glass correction 0.15–0.18mm Water immersion	
CFI Plan Apochromat 100x Oil CFI Plan Apochromat DM 100x Oil	1.40 1.40	0.13 0.13	2.0 2.0	0.21 0.21	245 245	Spring-loaded Stopper Spring-loaded Stopper	 ph3
CFI Plan Apochromat 100x NCG Oil	1.40	0.17	2.0	0.21	245	Spring-loaded Stopper No cover glass	

CFI S Fluor Series

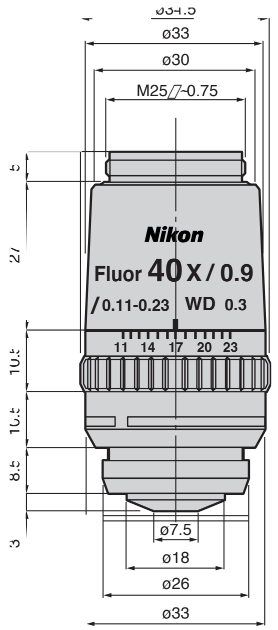
These objectives ensure a high transmission rate of ultraviolet wavelengths down to 340 nm for fluorochromes like indo-1, fura-2, and fluor-3. Also, these objectives have improved signal-to-noise ratios (S/N) for short wavelengths and have high N.A., making the fluorescence images they produce significantly sharper and brighter.



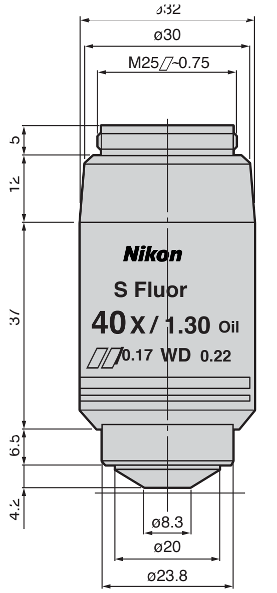
CFI S Fluor 10x



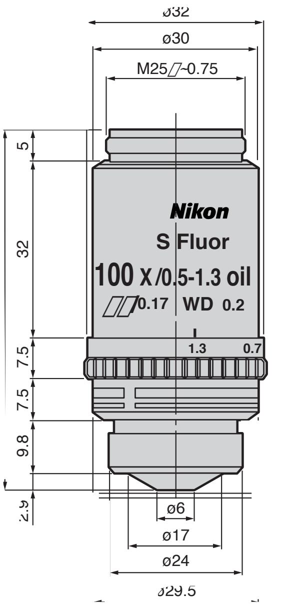
CFI S Fluor 20x



CFI S Fluor 40x C



CFI S Fluor 40x Oil



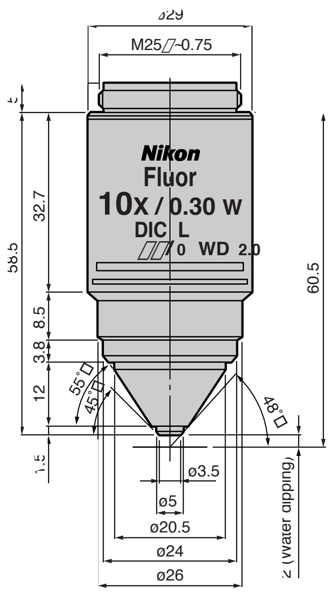
CFI S Fluor 100x Oil

Objectives (magnification)	N.A.	W.D. (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Remarks
CFI S Fluor 10x	0.50	1.2	10.0	1.10	275	Spring-loaded
CFI S Fluor 20x	0.75	1.0	10.0	0.49	275	Spring-loaded
CFI S Fluor 40x C	0.90	0.3	5.0	0.34	285	Spring-loaded Cover glass correction 0.11–0.23mm
CFI S Fluor 40x Oil	1.30	0.22	5.0	0.25	275	Spring-loaded
CFI S Fluor 100x Oil	1.30	0.2	2.0	0.25	285	Spring-loaded

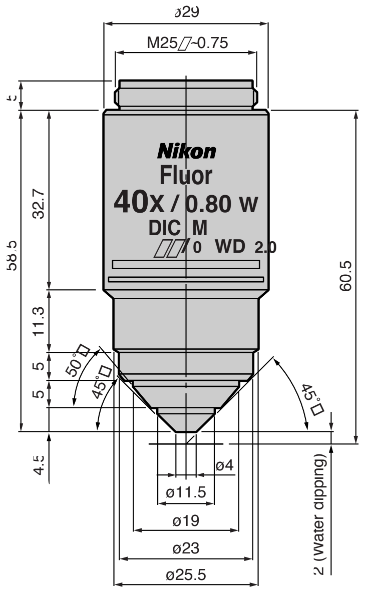
CFI60 OBJECTIVES

Water Dipping Series

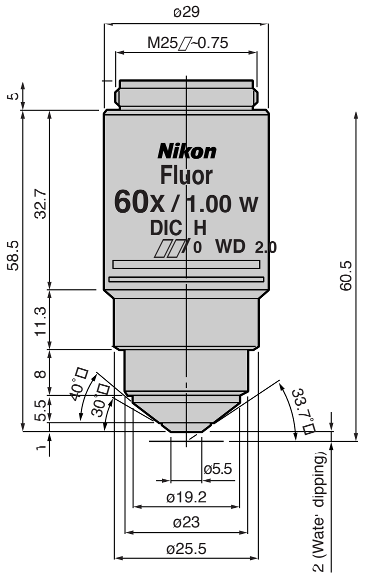
These objectives (no cover glass) are designed with a narrow top and a 2mm working distance to allow microelectrodes to be inserted into the specimen at 45°. They use ceramic and glass nose cones to isolate them thermally and electronically. Since they are FLUOR lenses, they are designed for fluorescence and have very high transmission in the UV and IR wavelengths with a high signal-to-noise ratio for superior images.



CFI Fluor 10x W



CFI Fluor 40x W



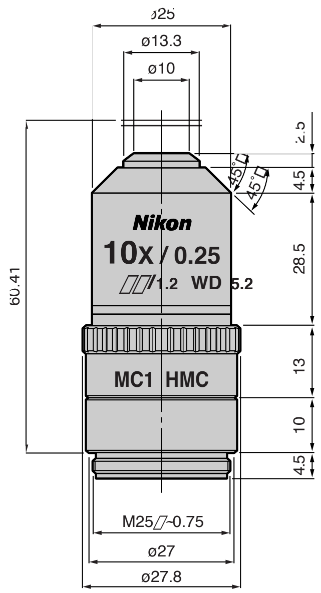
CFI Fluor 60x W

Objectives (magnification)	N.A.	W.D. (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Remarks
CFI Fluor 10x W	0.30	2.0	20.0	4.06	210	Water dipping
CFI Fluor 40x W	0.80	2.0	5.0	0.57	210	Water dipping
CFI Fluor 60x W	1.0	2.0	3.3	0.37	210	Water dipping

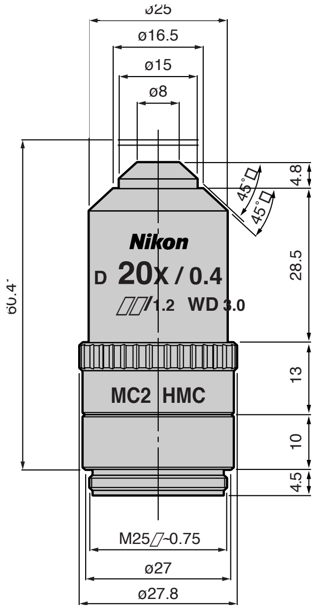
CFI HMC® Series for Hoffmann Modulation Contrast®

These objectives have been completely redesigned by Nikon, allowing the contrast direction to be changed using a modulator inside the objective. That direction, once set, is maintained over the entire magnification range from 10X to 40X.

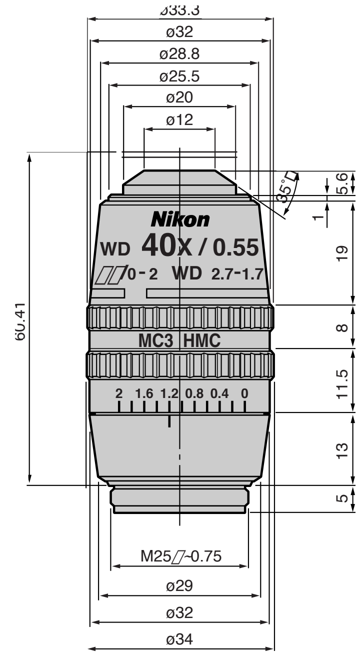
Note: Hoffman Modulation Contrast and HMC are registered trademarks of Modulation Optics Inc.



CFI HMC 10x



CFI HMC 20x F



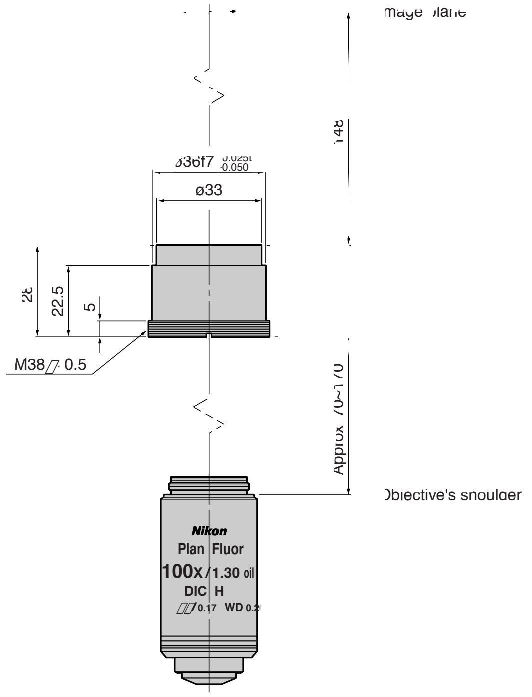
CFI HMC LWD 40x C

Objectives (magnification)	N.A.	W.D. (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Remarks
CFI HMC 10x	0.25	5.2	20.0	4.40	130	Cover glass thickness 1.2mm
CFI HMC 20x F	0.40	3.0	10.0	1.72	130	Cover glass thickness 1.2mm
CFI HMC LWD 40x C	0.55	2.7–1.7	5.0	0.91	210	Cover glass correction0–2mm

2nd Objective Lens Unit

This unit is attached to infinity objectives when neither a binocular or trinocular eyepiece tube is used.

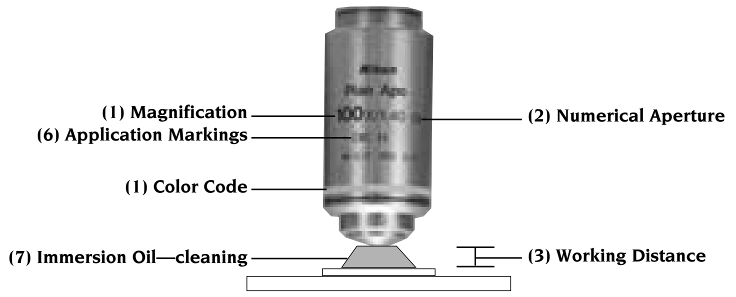
- Infinity Tube Lens Unit for CFI objectives (chromatic aberration-free infinity corrected objectives).
- Focusing distance: 200mm (7.87 in.)
- To obtain the optimal objective performance, keep the distance between the tube lens and the objective's shoulder within 100–200 mm (3.84–7.87 in.).

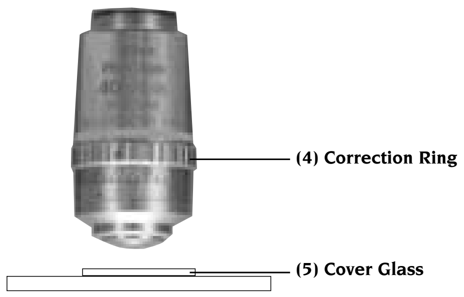


2nd Objective Lens Unit

CFI60 OBJECTIVES

Markings on CFI60 Objectives





Nikon offers a wide variety of CFI objectives. To assist the user they are clearly marked with information on the objective barrel such as: which DIC module or Phase Ring to use.

(1) Magnification and Color Code

A color coded ring on the barrel identifies the magnification of the objective:

Mag.	1X	2X	4X	10X	20X	40X	50X	60X	100X
Color code	Black	Gray	Red	Yellow	Green	Light Blue	Light Blue	Cobalt Blue	White

(2) Numerical Aperture (N.A.)

N.A. is the most important factor in defining the performance characteristics of an objective.

N. A.= n sin θ

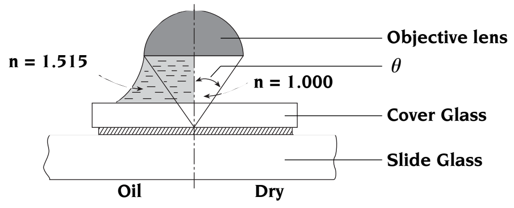
n: the refractive index of the media at d-line (587nm)

For dry objective n=1.000 (air)

For oil objective n=1.515 (oil)

For water objective n= 1.333 (water)

θ :Half angle of incident rays to the top lens of the objective



The higher N.A., the higher resolving power.

When the resolving power is defined as the power to recognize the two points,

$$R= \frac{\lambda}{2N.A.}$$

or

$$R= \frac{\lambda}{N.A.\ Obj.\ +N.A.\ Cond.}$$

The higher N.A. the brighter image we take.

$$\text{Brightness: } B \propto \left\{\frac{N.A.}{\text{Total Magnification}}\right\}^2$$

The higher N.A., the shallower the depth of focus (DOF).

$$DOF = \frac{\lambda}{N.A.^2}$$

(3) Working Distance

Working distance (W.D.) defines the distance between the top lens of the objective and the surface of the cover glass.

CFI60 objectives can offer longer working distance with high numerical aperture.

(4) Correction Ring

Dry objectives with high Numerical Aperture are susceptible to spherical and other aberrations which can impair resolution and contrast when used with a cover glass whose thickness differs from the specified value. A 1 1/2 cover glass (0.17mm thick) should be used as standard, however not all 11/2 cover glasses are exactly 0.17mm and many specimens have media between them and the cover glass. The correction ring is used to adjust for these subtle differences to ensure the optimum objective performance.

How to use the correction ring

- ● Position the ring at 0.17. The thickness of the standard cover glass is 0.17mm.
- ● Focus the lens on a small artifact in the specimen.
- ● Rotate the ring very slightly and focus the lens again to check if the image has improved or degraded.
- ● Repeat the above step to determine if the image is improving or degrading in the direction you are turning the ring.
- ● If the image has degraded, follow the same procedure in the opposite direction to find the position offering optimum resolving power and contrast.

(5) Cover Glass

For optimum performance, the thickness of the cover glass should be 0.17mm. For example, at N.A.=0.95, a 0.01mm difference in thickness reduces image formation by 45% from the ideal image.

N.A.	Difference in cover glass thickness 0.01mm	0.02mm
0.3	100%	100%
0.45	100	100
0.7	98	92
0.85	81	43
0.95	45	29

(6) Application Markings

DIC: for Differential Interference Contrast

DM: Phase contrast, Dark contrast middle type

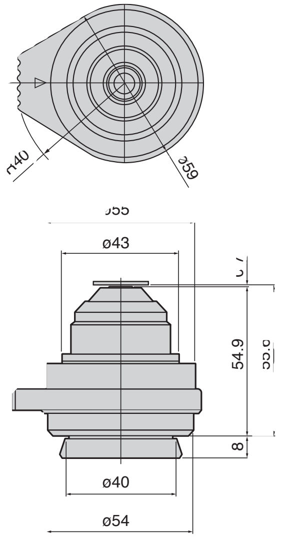
DL: Phase contrast, Dark contrast light type

DLL: Phase contrast, Lower contrast type

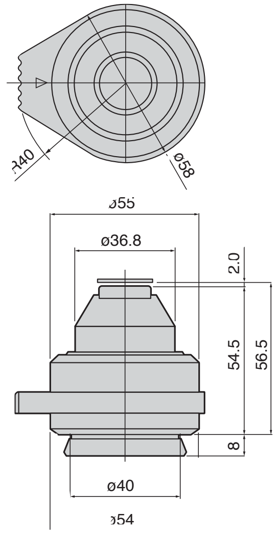
(7) Immersion Oil—cleaning

After using immersion oil, gently blot the lens dry with lens tissue. Then slightly moisten a piece of lens tissue with petroleum benzene (Naphtha) and clean off all traces of the oil from the immersion objective. Cleaning is essential for water immersion objectives as well; after use, wipe the water off the top lens.

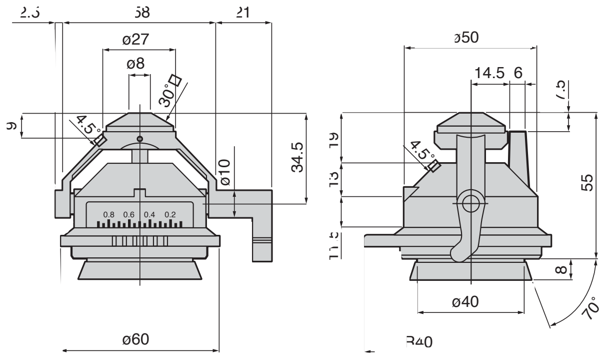
Condensers



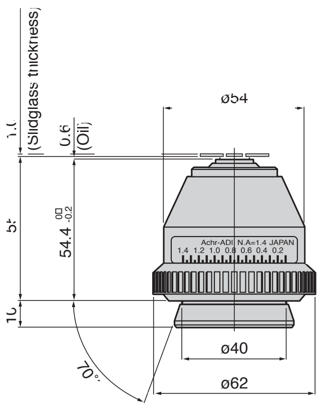
C-C Abbe Condenser, Dry Type



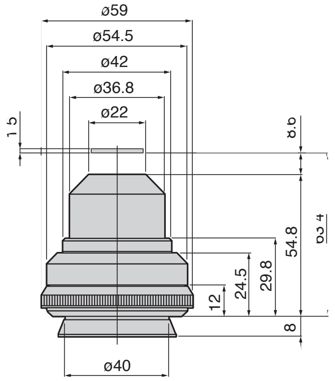
C-C Achromat Condenser



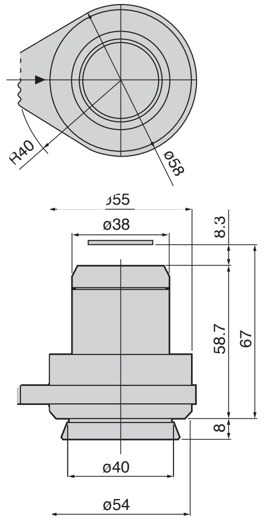
Achromat Swing-out Condenser



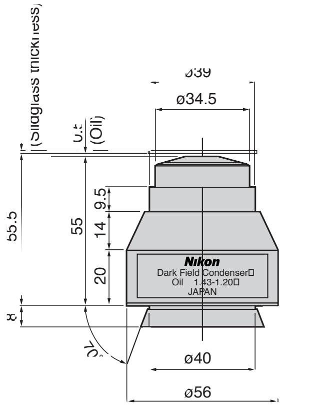
C-C Achromat /Aplanat Condenser



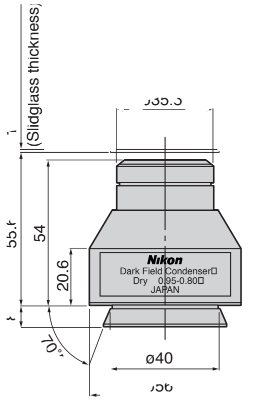
LWD Achromat Condenser



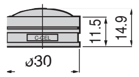
C-C Low Power Condenser



Dark Field Condenser, Oil



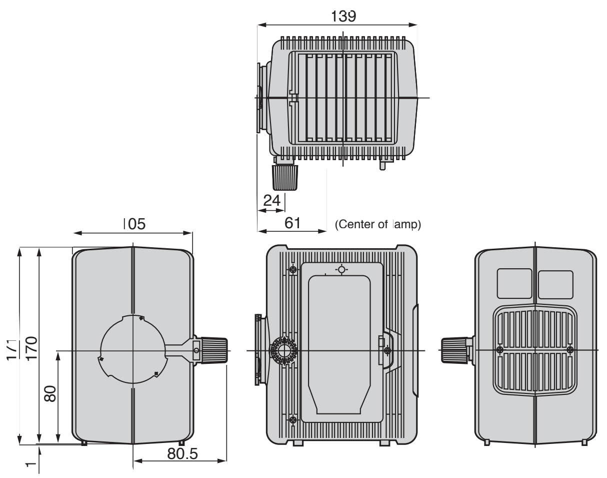
Dark Field Condenser, Dry



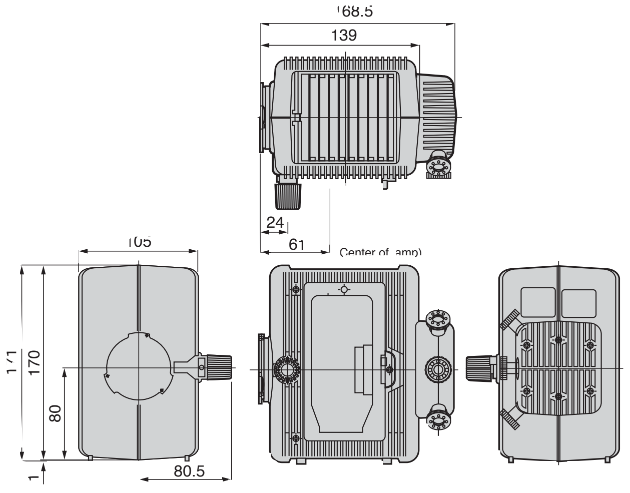
C-CEL Expander Lens (for darkfield)

Type	N.A.	Object distance (mm)	Magnification
C-C Abbe Condenser, Dry Type	0.9	1.9	4–100x
C-C Achromat Condenser	0.8	4.2	4–100x
Achromat Swing-out Condenser	0.9/0.22	1.8	2–100x
C-C Achromat /Aplanat Condenser	1.40	1.6	10–100x
LWD Achromat Condenser	0.65	10.2	4–40x
C-C Low Power Condenser	0.13	10.2	1–4x
Dark Field Condenser, Oil	1.2–1.43	1.5	20–100x
Dark Field Condenser, Dry	0.8–0.95	4.0	20–40x

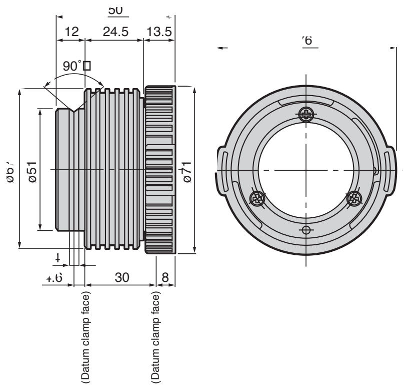
Illumination Systems



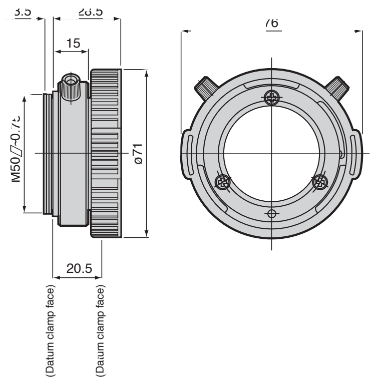
Lamphouse HMX-3B



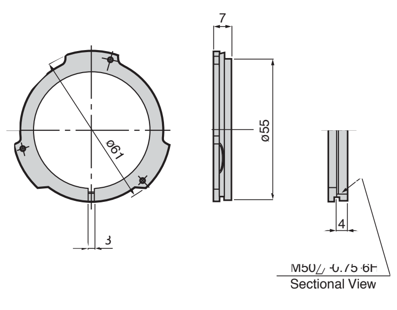
Lamphouse HMX-4B, built-in back mirror



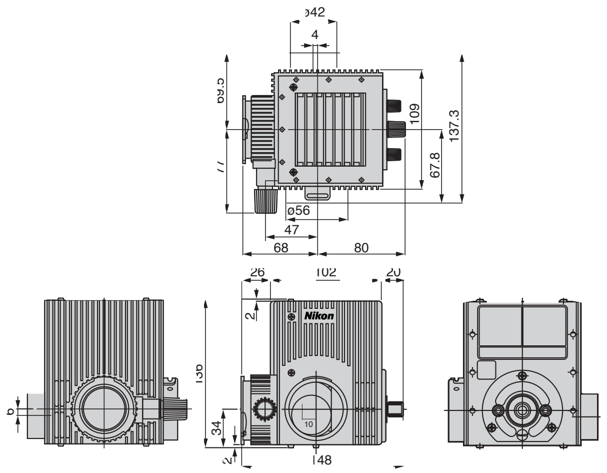
C-LA HMX Lamphouse Adapter



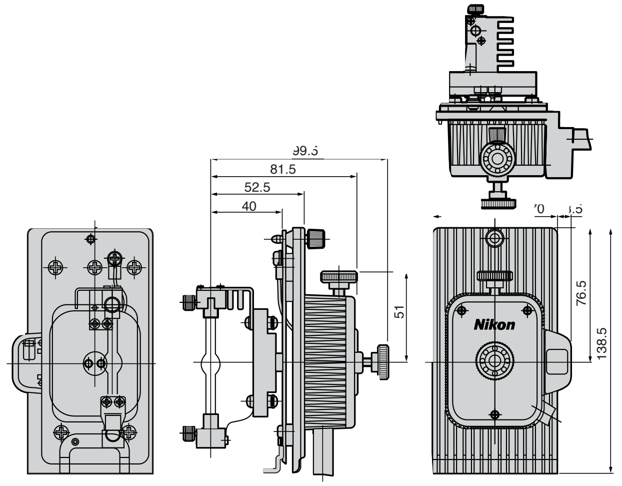
HMX Connecting Adapter SB-X1
(Bayonet to Screw)



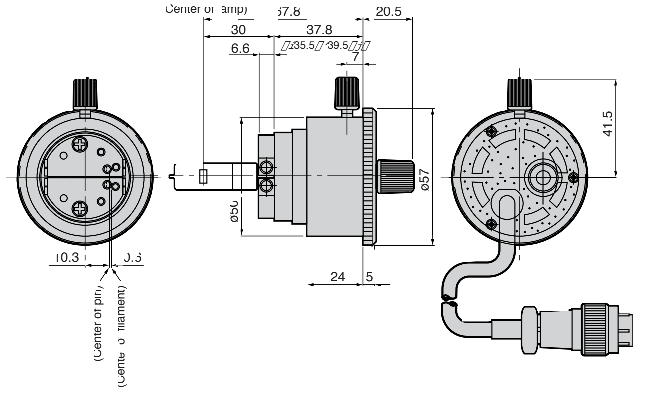
HMX Connecting Adapter SB-X2
(Screw to Bayonet)



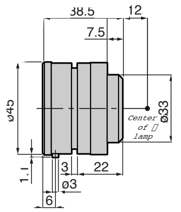
Lamphouse HMX



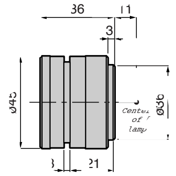
Mercury Lamp Socket S 100W for HMX-3B



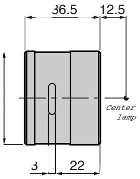
Halogen Lamp Socket 100W/HMX



C-FC Epi-Fl Collector Lens

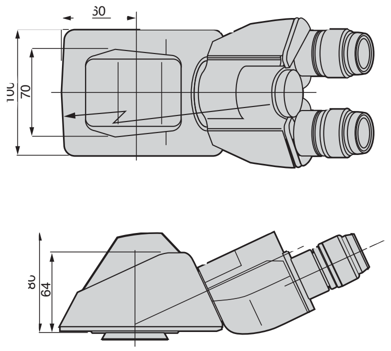


Quartz Epi-Fl Collector Lens

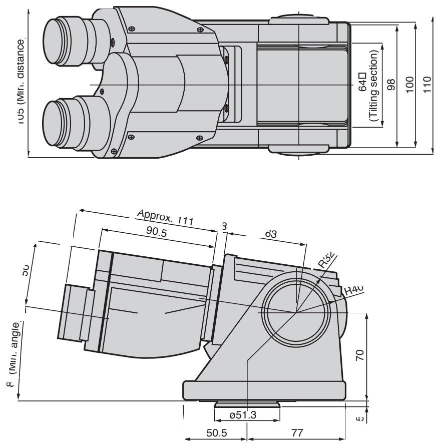


Collector Lens/QH100W

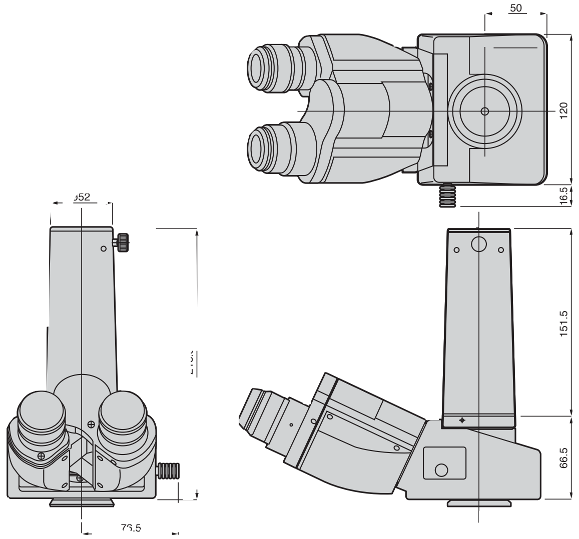
Eyepiece Tubes



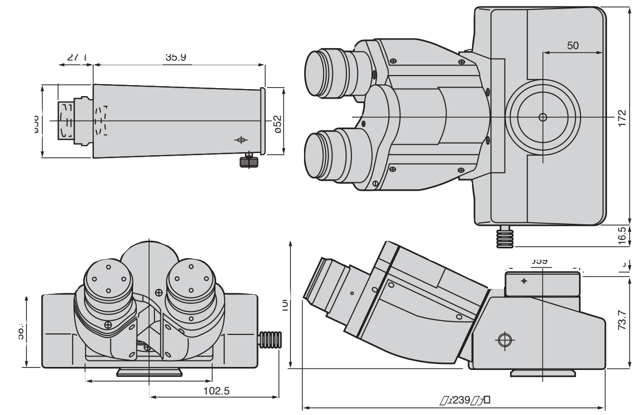
Y-TB Binocular Tube



Y-TE Ergonomic Binocular Tube



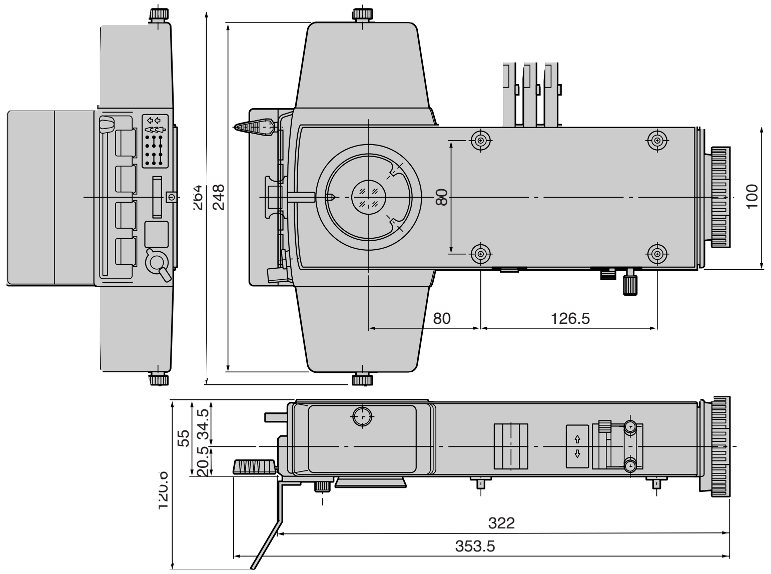
Y-TF Trinocular Tube "F" UW



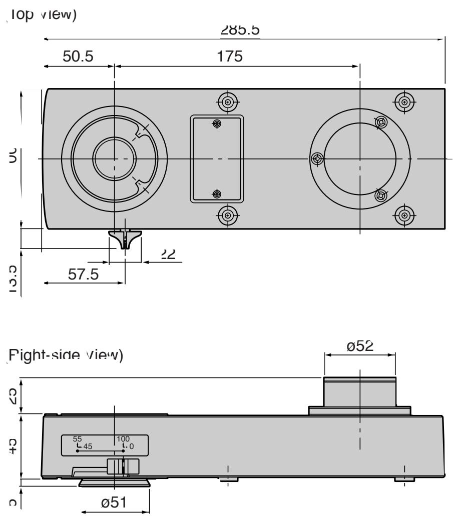
Y-TT Trinocular Tube "T" UW

Y-TB Binocular Tube	F.O.V. 22mm
Y-TE Ergonomic Binocular Tube	F.O.V. 22mm with tilting angle of 8° to 32° and telescopic mechanism of ±15mm movement
Y-TF Trinocular Tube "F" UW	Two-way: 100 : 0 or 0 : 100 (observation : photo) F.O.V. 22mm or 25mm with eyepiece reticule orientation adjustment mechanism
Y-TT Trinocular Tube "T" UW	Three-way: 100 : 0, 20 : 80, or 0 : 100 (observation : photo) F.O.V. 22mm or 25mm with eyepiece reticule orientation adjustment mechanism

Intermediate Tubes

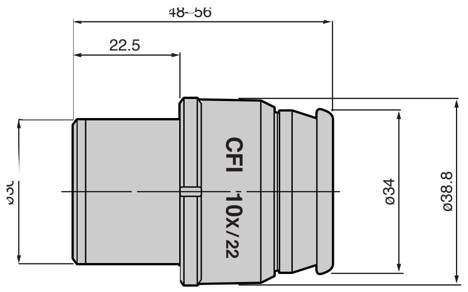


Y-FL Epi-Fl Attachment

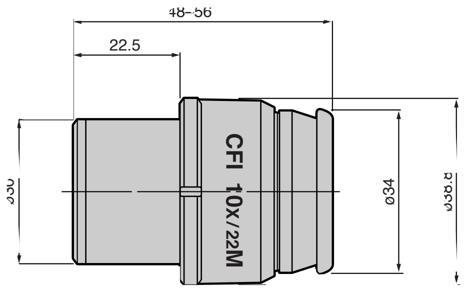


Y-IDP Double Port

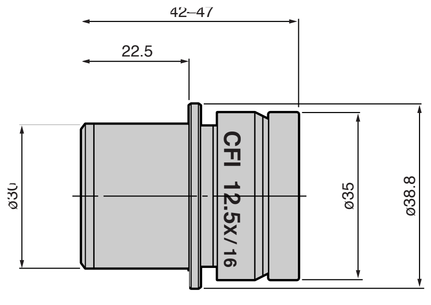
Eyepieces



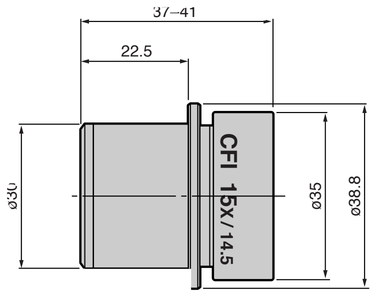
CFI 10x with diopter adjustment



CFI 10x M Photomask with diopter adjustment



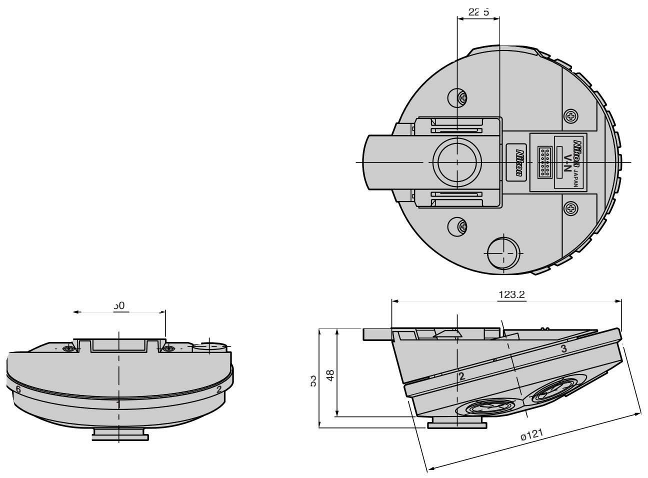
CFI 12.5x with diopter adjustment



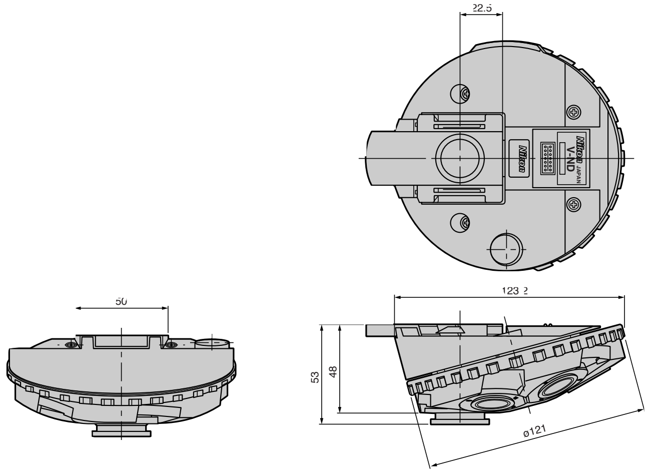
CFI 15x with diopter adjustment

Type (magnification)	F.O.V.	Remarks
CFI 10x with diopter adjustment	22mm	
CFI 10x M Photomask with diopter adjustment	22mm	With photomask reticule
CFI 12.5x with diopter adjustment	16mm	
CFI 15x with diopter adjustment	14.5mm	

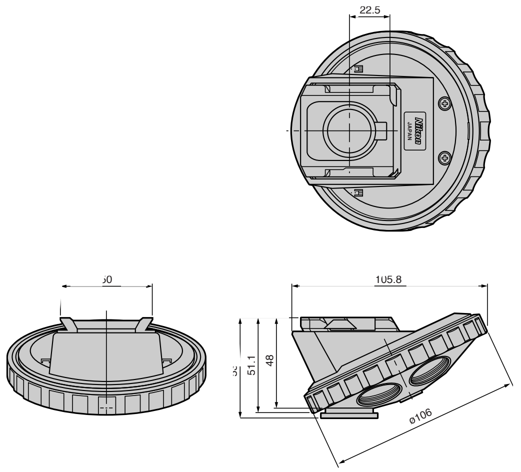
Nosepieces



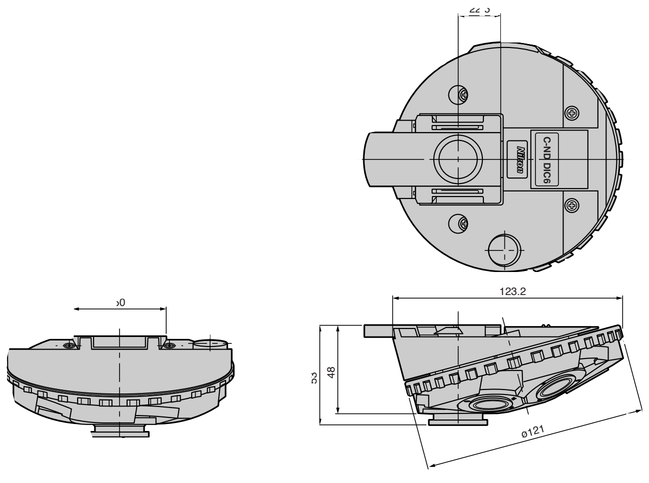
V-NA Motorized Sextuple Nosepiece



V-ND MG-DIC Intelligent Sextuple Nosepiece

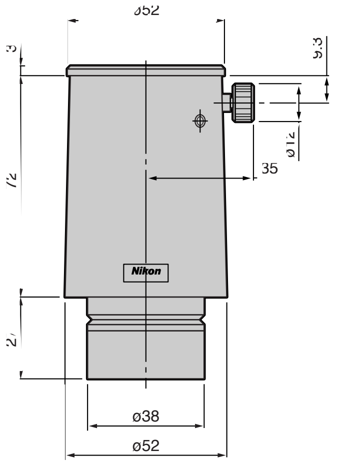


C-N Sextuple Nosepiece

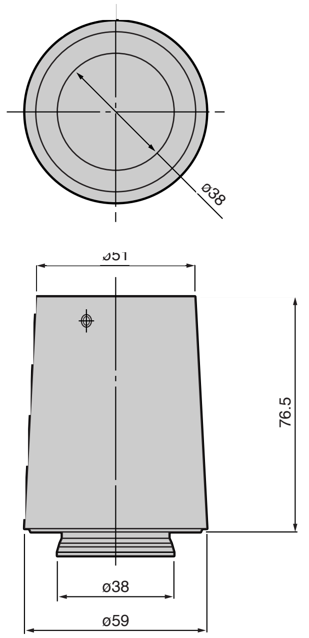


C-ND Sextuple DIC Nosepiece

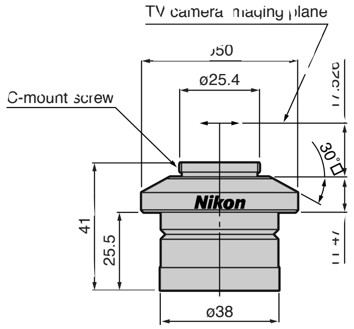
CCTV Camera Adapters



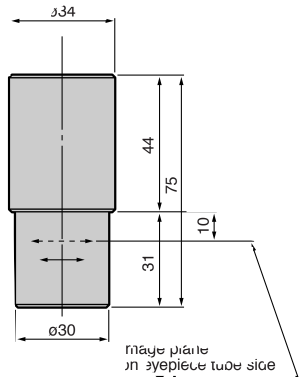
V-T Photo Adapter



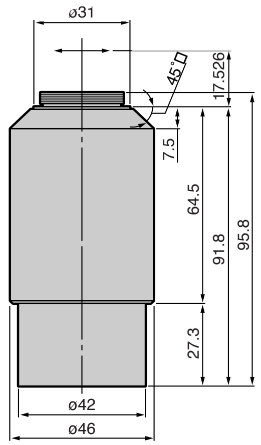
Y-T TV Tube for C-Mount Adapter A



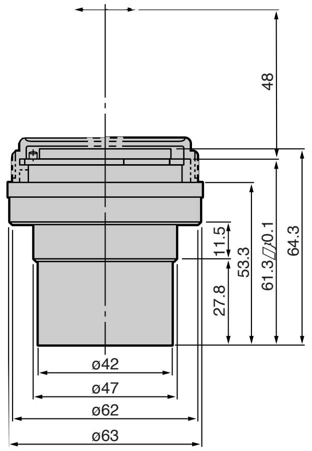
C-Mount TV Adapter A



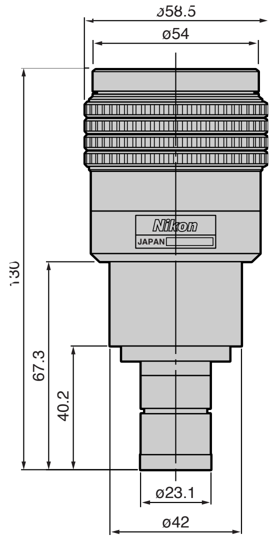
Relay Lens 1x I



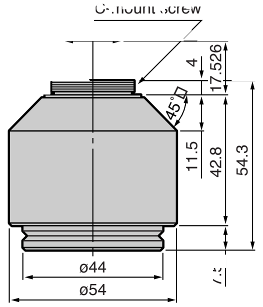
C-Mount TV Adapter



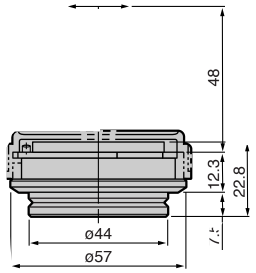
ENG-Mount TV Adapter



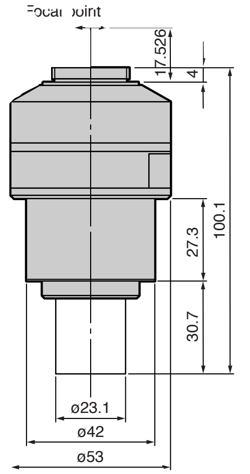
Zoom Lens



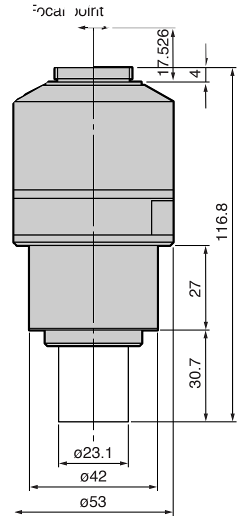
C-Mount Zooming Adapter



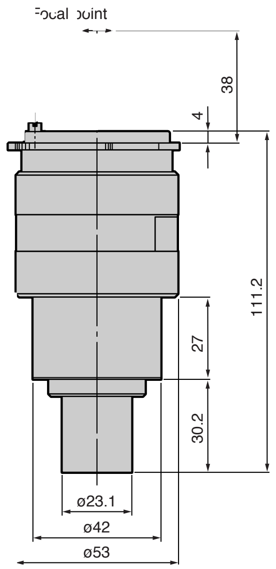
ENG-Mount Zooming Adapter



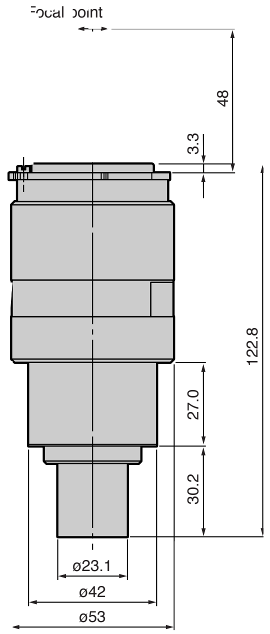
C-Mount TV Adapter 0.45x



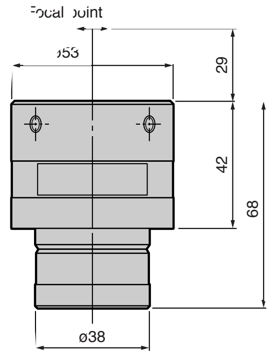
C-Mount TV Adapter 0.6x



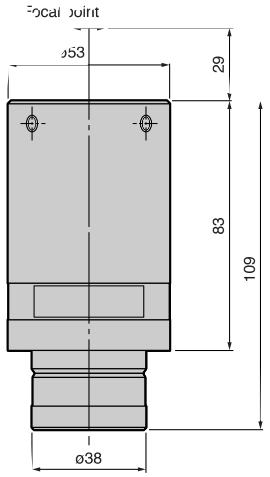
ENG-Mount TV Adapter 0.45x
(for Trinocular Tube “F”, “T”)



ENG-Mount TV Adapter 0.6x
(for Trinocular Tube “F”, “T”)



C-Mount TV Adapter VM 2.5x



C-Mount TV Adapter VM 4x